

WE CLAIM:

1. A process for drying solids initially wet with water, the process comprising:
 - (a) contacting a feed stream comprising solids having interstitial spaces, and water present in the interstitial spaces with a first solvent;
 - (b) displacing the water present in the interstitial spaces with the first solvent to provide solids with the first solvent in the interstitial spaces;
 - (c) contacting the feed stream having the first solvent in the interstitial spaces with a second solvent; and
 - (d) displacing the first solvent present in the interstitial spaces with the second solvent to provide solids having the second solvent in the interstitial spaces.
2. The process according to claim 1, further comprising the step of:
 - (e) removing the second solvent from the solids by the application of heat.
3. The process according to claim 1, wherein the step of contacting a feed stream with a first solvent comprises:
 - (a) contacting a feed stream with a first solvent having a heat of vaporization lower than the heat of vaporization of water and is soluble with water
4. The process according to claim 3, wherein the step of contacting the feed stream with a second solvent comprises:
 - (a) contacting the feed stream with a second solvent having a heat of vaporization lower than the heat of vaporization of the first solvent.
5. The process according to claim 4, wherein the step of contacting the feed stream with a second solvent comprises:

(a) contacting the feed stream with a second solvent that is miscible with the first solvent.

6. The process according to claim 5, wherein the step of contacting a feed stream with a first solvent comprises:

(a) contacting a feed stream with a first solvent that is an alcohol.

7. The process according to claim 6, wherein the step of contacting a feed stream with a first solvent that is an alcohol comprises:

(a) contacting a feed stream with a first solvent that is ethanol.

8. The process according to claim 5, wherein the step of contacting the feed stream with a second solvent comprises:

(a) contacting the feed stream with a second solvent that is n-propyl bromide.

9. The process according to claim 5, wherein the step of contacting the feed stream with a second solvent comprises:

(a) contacting the feed stream with a second solvent that is an ether.

10. The process according to claim 9, wherein the step of contacting the feed stream with a second solvent that is an ether comprises:

(a) contacting the feed stream with a second solvent that is one of ETBE and MTBE.

11. The process according to claim 1, wherein:

(a) contacting a feed stream with a first solvent comprises contacting a feed stream with an alcohol;

(b) contacting the feed stream with a second solvent comprises contacting the feed stream with n-propyl bromide; and the process further comprises:

(c) obtaining an ether product that is at least 95% pure ether; and

(d) obtaining an alcohol product that is at least 90% pure alcohol.

12. The process according to claim 11, wherein the step of obtaining an alcohol product that is at least 90% pure ethanol comprises:

(a) obtaining an alcohol product that is at least 95% pure ethanol.

13. The process according to claim 1, wherein:

(a) contacting a feed stream with a first solvent comprises contacting a feed stream with an alcohol;

(b) contacting the feed stream with a second solvent comprises contacting the feed stream with an ether; and the process further comprises:

(c) obtaining an ether product that is at least 95% pure ether; and

(d) obtaining an alcohol product that is at least 90% pure ethanol.

14. The process according to claim 13, wherein the step of obtaining an alcohol product that is at least 90% pure ethanol comprises:

(a) obtaining an alcohol product that is at least 95% pure ethanol.

15. A process for drying solids initially wet with water, the process comprising:

(a) providing a feed stream comprising solids having interstitial spaces, and water present in the interstitial spaces;

(b) providing an ethanol source stream;

(c) providing an ether source stream;

(d) displacing the water present in the interstitial spaces with the ethanol to provide solids with ethanol in the interstitial spaces;

(e) displacing the ethanol present in the interstitial spaces with n-propyl bromide to provide solids with n-propyl bromide in the interstitial spaces;

(f) removing the n-propyl bromide from the solids by the application of heat.

16. The process according to claim 15, wherein said step of displacing the water present in the interstitial spaces with the ethanol to provide solids with ethanol in the interstitial spaces comprises:

- (a) in a solid-liquid extractor, displacing the water present in the interstitial spaces with the ethanol to provide solids with ethanol in the interstitial spaces; and
- (b) obtaining an aqueous stream comprising the water and ethanol.

17. The process according to claim 16, further comprising:

- (a) feeding the aqueous stream to a liquid-liquid extractor;
- (b) providing a second ether source stream; and
- (c) processing the aqueous stream and the second ether source stream in the liquid-liquid extractor to obtain an aqueous bottom stream comprising water and ethanol and a top organic stream comprising ether and ethanol.

18. The process according to claim 17, further comprising:

- (a) distilling the aqueous bottom stream to obtain an ethanol stream and a water stream.

19. The process according to claim 15, wherein said step of displacing the ethanol present in the interstitial spaces with n-propyl bromide to provide solids with n-propyl bromide in the interstitial spaces comprises:

- (a) in a second solid-liquid extractor, displacing the ethanol present in the interstitial spaces with ether to provide solids with ether in the interstitial spaces.

20. A process for drying solids initially wet with water, the process comprising:

- (a) providing a feed stream comprising solids having interstitial spaces, and water present in the interstitial spaces;
- (b) providing a first solvent from a source stream;
- (c) providing a second solvent from a source stream;

- (d) displacing the water present in the interstitial spaces with the first solvent to provide solids with the first solvent in the interstitial spaces;
- (e) displacing the first solvent present in the interstitial spaces with the second solvent to provide solids the second solvent in the interstitial spaces; and
- (f) removing the second solvent from the solids by the application of heat.